enging charge of air through said combustion-chamber at a period of the cycle when the engine is not exhausting.

3. In an explosive-engine, in combination, a cylinder, a stationary combustion-chamber, a valve between the same and the cylinder, and means for forcing the air through the combustion-chamber when said valve is closed.

4. In an explosive-engine, in combination, a cylinder, a crank-casing connected thereto, a separable stationary combustion-chamber, a passage-way leading from the crank-chamber to the combustion-chamber, and a valve for controlling said passage-way.

5. In an explosive-engine, in combination, a cylinder, a stationary combustion-chamber, a valve for controlling communication between the two, means for forcing a scavenging charge through the combustion-chamber, a valve for controlling such charge, and means for opening said valve when the combustion-chamber valve is closed.

6. In an explosive-engine, in combination, a cylinder, a crank-casing connected thereto, a separate stationary combustion-chamber, a passage-way leading from the crank-chamber to the combustion-chamber, a scavenging-valve for controlling said passage-way, a partition between the combustion-chamber and cylinder, a valve controlling an opening in said partition, and means for opening the scavenging-valve when the last-mentioned valve is closed.

7. In an explosive-engine, in combination, a cylinder, a combustion-chamber divided into compartments, a valve for controlling communication between the compartments, means for admitting a scavenging charge into the compartment farthest from the cylinder, and means for simultaneously holding open the valve between the compartments, and the exit-valve from the compartment nearest the cylinder.

8. In an explosive-engine, in combination, a cylinder, a closed crank-casing connected therewith, a plurality of combustion-chambers communicating with each other and one communicating with the cylinder, an igniter in the combustion-chamber which communicates with the cylinder, a valved exhaust passage-way from said combustion-chamber, means controlling communication between the combustion-chambers, a valved passage-way from the crank-casing leading into the combustion-chamber farthest from the igniter to admit a scavenging charge of air thereto.

9. In an explosive-engine, in combination, a cylinder, a stationary combustion-chamber, a valve controlling communication between the two, a crank-shaft, mechanism operated from the motion thereof to operate said valve, and means for forcing a scavenging charge through the combustion-chamber when the valve is closed.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

JOSEPH A. WILLIAMS.

Witnesses:

ALBERT H. BATES,

B. W. BROCKETT.